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Safety Device in Waste Shredders

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Safety Device in Waste Shredders

Description

The invention relates to a safety device in waste shredders according to the preamble of claim 1.

In document shredders, the cutting unit is customarily covered by a housing so that, from outside, getting one's hands into it is only possible with difficulty. This is normally achieved by appropriate dimensioning of the in-feed shaft. However, particularly in the case of waste shredders that can shred even larger objects, e.g. larger files, etc., in one piece, limiting access to the cutting unit is no longer possible. In particular in the case of those waste shredders it can also frequently happen that larger metal objects, e. g. samples contained in files or the like, are drawn in as well, which could lead to damage of the cutting unit.

The objective of the invention is to provide a safety device that on the one hand eliminates any danger to the operator and on the other hand also protects the cutting unit.

To realize this objective the feature of claim 1 is proposed according to the invention.

In a preferred form of embodiment the actuation element can be disposed on the load side in front of the edge of the in-feed table and can be actuable by the operator. If then the distance between the actuation element and the cutting unit is greater than one arm length of the operator, then, if the operator bends over the in-feed table to reach in the direction of the cutting unit when, for example, a jam has occurred there, she/he would certainly actuate the actuation element with her/his body and thus put the cutting unit out of operation. The safety device therefore functions automatically but does not prevent normal operation. It can, for example, be a horizontal bar disposed in front of the face of the in-feed table, where said bar can be guided so that actuation at an arbitrary point is certain to actuate the switching device. That can be achieved by parallel guiding of the bar or by two switches.

In the case of another preferred form of embodiment the actuation element can be a sensor responding to metal, in particular to ferromagnetic materials, preferably working without contact, where said sensor is disposed in an advantageous manner below the in-feed table. It can be disposed below the belt of an in-feed conveyor formed, for example, as a belt conveyor and automatically put it, and in given cases the cutting unit, out of operation if a larger metal object

attempts to pass. Thereby the cutting unit is protected against the objects most likely to damage it, namely metals.

These and additional features of preferred extensions of the invention follow from the subordinate claims and the description in connection with the drawings, where the individual features can each be realized, by themselves alone or in groups, in the form of subcombinations in forms of embodiment of the invention and in other fields. An embodiment example is represented in schematic form in the drawings and is explained in more detail. Shown are:

Figure 1 a cross section through a with safety device and

Figure 2 a partial frontal view.

The waste shredder 11 represented in the drawing is a floor-mounted device with a housing 12. In it, driven by a motor 13, a cutting unit 14, with cutting rollers 15 working together and turning in opposite directions, is disposed. An in-feed shaft 16 leads to the cutting unit 14 and behind the cutting unit an ejection shaft 17 is provided.

The in-feed shaft 16 is formed between the upper boundary of the housing and an in-feed table 18, which covers a front part 20 projecting from the housing toward the operating side 19. The surface of the essentially horizontal in-feed table 18 is formed in part by an in-feed conveyor 21 which is formed as a belt conveyor also driven by the motor 13 and at one end reaches up to the cutting unit and at the other end reaches out from the in-feed shaft 16 up to a position which lies at some distance

from the operator-side face 22 of the in-feed table.

On this face, which at the same time forms the face of the projection 20, an operating element 24, in the form of a horizontal bar reaching over the width of the in-feed table, is disposed somewhat below the front edge 23 of the in-feed table. By angle levers 25 connected to the horizontal bar, said bar can be pivoted on its two sides about a horizontal pivot axle 27 lying below it and is guided in parallel. During its actuation in the direction toward the cutting unit, it actuates a switching device 28 which consists of a switch switching off during actuation. It shuts down the motor 13. After actuation is completed the switch does not switch itself on once again but rather must be switched on once again by a suitable manual actuation, for example, by manually pulling the bar back, actuating a stop button, etc., so that the cutting unit can run once again.

The distance between the face 22 and the cutting unit is chosen so that it is greater than a customary arm length of an operator, that is, greater than 60 cm, preferably 80 cm. This distance also depends on whether in the given arrangement of the in-feed table the operator can bend her/his upper body over the in-feed table. In this case the distance between the cutting unit and the face 22 is to be made accordingly greater, in each case so that an operator of normal size cannot reach the cutting unit with her/his fingers without supporting her/himself by her/his body on the face and in so doing automatically actuating the actuation element 24 in the sense of a switch-off. The in-feed shaft 16 is long enough to prevent reaching into the cutting unit from other directions. This

safety device utilizes the fact, of which the user is not even conscious but certainly occurs continuously, that a user in bending forward, in particular if she/he wants, for example, to pull out material which has gotten stuck there, must support her/himself on the front wall in order to stand securely.

Below the upper side of the in-feed conveyor 21 and disposed in the area of the operator-side end of the in-feed conveyor is an actuation element 30 which either reaches over the greater part of the width of the in-feed conveyor or consists of several individual sensors. This actuation element can be a metal detector or in particular a sensor responding to ferromagnetic materials, for example, a Hall probe. It provides a signal to a switching device 31 which in turn contains a switching element to switch off the motor. If a larger metal object moves over the conveyor, then the actuation element 30 responds and the motor is switched off until the damaging part has been removed and the motor, in appropriate, is switched on once again by conscious actuation.

In the case of in-feed tables which have no conveyor, a sensor of this type could also be disposed below the normal table surface and then respond to objects pushed over it. In each case the actuation element 30 is disposed so that it lies not too far removed from the mouth of the in-feed table 16 so that it is not evaded by material only tossed into the central area of the in-feed table. The location for installation must be chosen with regard to these points of view.

In order to avoid unintentional actuation if the operator only lightly bumps against the actuation element 24, said actuation element can be provided with a blocking device which is triggered only for greater force of actuation, such as leaning against it. The blocking device can be formed by a counterspring 40 acting on the bar, by a switch 28 with greater force of actuation, or the like.

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~~Patent~~ Claims

Safety Device in
Waste Shredders

1. Safety device in waste shredders, in particular document shredders (11) with a cutting unit (14) disposed in a housing (12) and an in-feed table (18) leading from a loading side (19) to the cutting unit (14) characterized by the fact that in the area of the in-feed table (18) at a horizontal distance in front of the cutting unit (14) an automatically actuable actuation element (24, 30) of a switching device (28, 31) is disposed for switching off the cutting unit (14) and/or a feed device (21) therefor.

2. Safety device according to claim 1 characterized by the fact that the actuation element (24) is disposed on the loading side (19) in front of the face (22) of the in-feed table and can be actuated by the body of the operator

and that the distance between the actuation element (24) and the cutting unit (14) is greater than one arm length of the operator.

3. Safety device according to claim 2 characterized by the fact that the actuation element (24) is a bar disposed essentially horizontally in front of the face (22) of the in-feed table (18), said bar preferably being guided in such a manner that its actuation on each of its sides actuates the switching device (28).

4. Safety device according to claim 3 characterized by the fact that the bar is guided in such a manner that it can be pivoted about a pivot axle (27) disposed below it.

5. Safety device according to claim 1 characterized by the fact that the actuation element (30) is a sensor responding to metal, in particular to ferromagnetic materials, preferably working without contact.

6. Safety device according to claim 5 characterized by the fact that the sensor is disposed below the in-feed table (18), preferably below an upper side of an in-feed conveyor (21).

7. Safety device according to on of the foregoing claims characterized by the fact that the in-feed table (18) contains an in-feed conveyor (21) which can be switched off by the safety device, preferably together with the cutting unit (14).

8. Safety device according to on of the foregoing claims characterized by the fact that the switching device (28, 31) contains a switching unit to be consciously switched on once again after switch-off.

9. Safety device according to one of the foregoing claims characterized by the fact that a part of the in-feed table (18) is surrounded by housing parts in such a manner that an in-feed shaft (16) leading to the cutting unit (14) is formed.

10. Safety device according to claim 1 characterized by the fact that the horizontal distance between actuation element (24) and the cutting unit (14) is greater than 60 cm, preferably 80 cm.

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